Articles

How House Officers Cope With Their Mistakes

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We examined how house officers coped with serious medical mistakes to gain insight into how medical educators should handle these situations. An anonymous questionnaire was mailed to 254 house officers in internal medicine asking them to describe their most important mistake and their response to it; 45% (N = 114) reported a mistake and completed the questionnaire. House officers experienced considerable emotional distress in response to their mistakes and used a variety of strategies to cope. In multivariate analysis, those who coped by accepting responsibility were more likely to make constructive changes in practice, but to experience more emotional distress. House officers who coped by escape-avoidance were more likely to report defensive changes in practice. For house officers who have made a mistake, we suggest that medical educators provide specific advice about preventing a recurrence of the mistake, provide emotional support, and help them understand that distress is an expected concomitant of learning from the experience.

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Many studies document that house officers experience considerable stress due to mistakes.[1-4] Little is known, however, about the strategies employed by physicians to cope with their mistakes and the extent to which these coping strategies affect their psychological well-being and subsequent medical practice. Information about the relationships among mistakes, coping, psychological well-being, and subsequent medical practice would help medical educators assist house officers to respond constructively when mistakes occur.

Research on other kinds of stress, including daily hassles, major life events, and chronic illness, suggest that some types of coping promote adaptive outcomes while other types of coping do not.[5-8] The judgment as to what constitutes adaptive or maladaptive coping in a given context depends on which outcomes are important in that specific context. Context must be taken into account because a particular coping strategy can be adaptive in one setting but maladaptive in another. For example, choosing not to think about a problem can be adaptive if nothing can be done, such as while waiting for test results, but can be maladaptive if problem solving and action are appropriate, as when a symptom appears that calls for medical attention.[9] In this study, we examined two outcomes that are important in understanding the consequences of residents' mistakes: the residents' changes in practice and psychological well-being. These outcomes reflect the two major functions of coping: a problem-focused function, in which coping is directed at the problem that is causing distress, and an emotion-focused function, in which coping is directed at managing the emotional distress caused by the problem.[9,10]

We previously reported how residents changed their practice following serious mistakes.[11] In this study we focused on the ways residents coped with their mistakes and how different ways of coping were related both to residents' subsequent changes in practice and to emotional distress. These analyses controlled for variables previously shown to be related to residents' reactions, including causes of the mistake, severity of the outcome, and institutional reactions.

Methods

In May 1989 we mailed an anonymous questionnaire to 254 house officers in three internal medicine training programs. Programs were located at large (greater than

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500 beds), academic, tertiary care hospitals. The procedures and development of the questionnaire have been described previously.[11]

Measures

Coping was measured using a shortened version of Folkman and Lazarus's "Ways of Coping" Scale.[12] The shortened version included six of the eight scales that make up the scale, and each comprised three items from the original scales. Scales measured the following kinds of coping: accepting responsibility, planful problem solving, seeking social support, emotional self-control, escape-avoidance, and distancing. Two scales, confrontive coping ("I tried to get the person to change his or her mind") and positive reappraisal ("I found new faith") were excluded because they did not seem relevant to medical mistakes. House officers were asked to indicate the extent to which they had used each strategy to cope after they made their mistake. An example of an item from the accepting responsibility scales is "I criticized or lectured myself" (Table 1). Possible responses were "not used," "used somewhat," "used quite a bit," and "used a great deal." Each type of coping was measured by summing responses to the three items in its scale. A higher score indicated a greater use of each strategy. The possible range of scores for each type of coping was 0 to 9.

TABLE 1.—*Ways of Coping Scale Scores and Item Frequency*

Ways of Coping (Cronbach's α)	Scale Score* Mean	SD	% Used†
Accepting responsibility (.45)	4.9	2.0	
Made promise things would be different next time			76.3
Criticized or lectured self			62.3
Apologized or did something to make up			21.1
Planful problem solving (.62)	4.1	2.3	
Concentrated on what to do next			52.6
Knew what had to be done, doubled efforts to make up			40.4
Made a plan of action and followed it			38.6
Seeking social support (.69)	3.3	2.2	
Talked to someone about feelings			45.6
Accepted sympathy and understanding from someone			31.6
Asked a relative or friend for advice			22.8
Emotional self-control (.67)	3.2	2.1	
Tried to keep feelings from interfering with other things			51.8
Tried to keep feelings to self			22.8
Kept others from knowing how bad things were			13.2
Escape-avoidance (.60)	2.1	2.1	
Wished situation would go away or be over			30.7
Had fantasies how things might turn out			27.2
Tried to make self feel better by eating, drinking, using drugs or medications			1.8
Distancing (.60)	1.2	1.5	
Didn't let it get to me			9.6
Went on as if nothing had happened			6.1
Tried to forget the whole thing			5.3

*Range of possible scale scores, 0 to 9. Higher score indicates the coping strategy was used more.
†Includes those answering "used quite a bit" or "used a great deal."

The development of scales to describe residents' reactions to the mistake, institutional response, characteristics and causes of the mistake, and residents' subsequent changes in practice has been described previously.[11] Emotional distress in response to the mistake was measured with four items. Residents were asked to what extent the mistake made them feel remorseful, angry at themselves, inadequate, and guilty. A mistake was defined as having a serious outcome if the house officer reported that it resulted in a prolonged hospital stay, a specific procedure, a change in therapy, or death. Institutional response was measured with two items that asked residents how they felt the mistake was handled by the institution. Causes of the mistake were described by three scales: inexperience (3 items), job overload (2 items), and case complexity (4 items). Changes in practice were assessed with a scale of constructive changes in practice containing nine items and a scale of defensive changes containing two items. For each concept, scale scores were created by summing responses to items. Because constructive and defensive changes measure separate concepts rather than polar opposites of the same scale, a house officer might report both constructive and defensive changes in practice after making a mistake.

Analysis

We performed three multiple linear-regression analyses to investigate how residents' coping strategies were related to their emotional distress after the mistake, later constructive changes in practice, and later defensive changes in practice. These analyses controlled for variables previously found to be related to changes in practice: the perceived causes of the mistake, the severity of the outcome, the degree to which house officers perceived that their institution was judgmental, and house-staff gender.[11] The analyses tested whether the extent to which residents used each of the six ways of coping added significantly to the explanatory power of the independent variables.

Results

Characteristics of Respondents

As previously reported, of the 254 residents surveyed, 114 (45%) responded by reporting a mistake and completing the questionnaire. The 114 respondents who completed the questionnaire made up our study group. Because results did not differ by site, we present only aggregated results. Women comprised 33% of subjects. In all, 36% of respondents were interns, 32% were junior residents, and 32% were senior residents. The distributions of gender and year of training were similar among respondents and nonrespondents.

Coping

Residents indicated the extent to which they had used each of the six strategies to cope after they made their mistake. Table 1 shows responses for the Ways of Coping items and scales, as well as the percentage of respondents who reported they had used a strategy "quite a bit" or "a great deal." Mean scale scores were highest for accepting responsibility and planful problem solving, indicating that these strategies were most often used. Scores were somewhat lower for seeking social support and controlling emotions and still lower for escape-avoidance and distancing. For example, on the "accepting responsibility" scale, residents indicated they used the following strategies "quite a bit" or "a great deal": "I made a promise to myself that things would be different next time" (76%), "I criticized or lectured myself" (62%), and "I apologized or did something to make up" (21%). Examples of these strategies can be seen in the residents' narratives about their mistakes. For example, after failing to recognize the importance of and initiate therapy for ventricular tachycardia, a resident wrote, "I hung the EKG strip in my room with a sign saying "Next time, remember to . . ." One resident administered intravenous fluids to a patient with cardiogenic shock, mistakenly thinking the patient was septic, and induced congestive heart failure. The resident wrote, "I can occasionally rationalize that I was not the proximate cause of his death, as the patient was deteriorating slowly, but I must accept that I likely accelerated the course of his demise."

Distress

In multivariate analysis controlling for causes of the mistake, severity of the outcome, residents' perception that the institution was judgmental, and their gender, residents were more likely to report emotional distress if they coped by accepting responsibility. In addition, residents were somewhat more likely to report distress if they reported coping by seeking social support or by controlling their feelings. The multiple correlation coefficient (total R^2) for the model for emotional distress was .47 (Table 2).

As we reported previously, residents described considerable emotional distress in response to the mistakes, the large majority describing remorse, anger, guilt, and feelings of inadequacy.[9] For example, one resident mistakenly ordered benzodiazepine on an as-needed basis for a patient with respiratory muscle weakness. Subsequently, the patient suffered respiratory failure and died. The resident wrote, "Although his private MD and others assured me that the 'prn' Ativan was not the factor that tipped him over, I was never sure of that. To this day, I don't know if he would be alive had I made sure that no sedatives were [prescribed]."

Changes in Practice

As previously reported, house officers described making various changes in their subsequent practice as a result of the mistake.[11] Some of these changes were constructive, but others were defensive. For example, 72% of residents agreed somewhat or agreed strongly that as a direct consequence of having made the mistake, they were more likely personally to confirm data, 62% reported they were more likely to seek advice, and 52% that they changed the way they organized information. Other constructive changes included asking questions of peers or superiors, reading, asking for references, paying more attention to detail, changing the organization of data, and trusting others' judgment less. On the other hand, 13% reported discussing mistakes less, and 6% reported avoiding patients with similar problems.[11] In multivariate analysis, residents were more likely to report constructive changes if they coped by accepting responsibility, controlling for causes of the mistake, severity of the outcome, the degree to which house officers perceived that their institution was judgmental, and house-staff gender. None of the other coping strategies were independently related to constructive change. The total R^2 for the model for constructive change was .49. Residents were more likely to report defensive changes if they coped by escape-avoidance. None of the other coping strategies were independently related to defensive change. The total R^2 for the model for defensive change was .35 (Table 2).

TABLE 2.—*Relation of Ways of Coping to Emotional Distress and Changes in Practice**

	Emotional Distress		Constructive Changes in Practice		Defensive Changes in Practice	
Coping Strategy	β	P Value	β	P Value	β	P Value
Accepting responsibility	.67	.0001	.69	.02	.14	.02
Seeking social support	.27	.05	.36	.21	.11	.18
Emotional self-control	.28	.07	−.26	.46	.07	.28
Escape-avoidance	.21	.13	.25	.33	−.06	.34
Planful problem solving	−.11	.35	−.03	.90	.02	.72
Distancing	.07	.69	.02	.94	.01	.90
Total R^2	.47		.49		.35	
Adjusted R^2	.39		.41		.25	

*This model controlled for causes of the mistake, severity of the outcome, the degree to which house officers perceived that their institution was judgmental, and house-staff gender.

Discussion

In this study, house officers who coped by accepting responsibility were more likely than those who did not accept responsibility to make constructive changes in practice, but they were also more likely to experience emotional distress. These outcomes illustrate the complexity of coping. The same behavior was related to both positive and negative effects, and according to our definitions, such coping was both adaptive and nonadaptive.

Previous studies have examined how physicians cope with general daily stressors[13-20] and identified a variety of coping strategies. A few qualitative studies have investigated how physicians cope with mistakes and uncertainty.[17,19] These studies did not deal with responses to specific mistakes and did not examine the complexity of physicians' coping responses. No studies have examined how coping affects subsequent adjustment and practice, though a few studies suggest that coping strategies may play a role in modulating physician stress[13,18,20-22] or work satisfaction.[13]

In contrast, this study focused on specific mistakes, allowing each house officer to recall an actual situation and his or her response. Our study used a multidimensional approach to coping and assessed outcomes in terms of subsequent changes in practice and emotional distress. Our finding that the coping strategy related to a desirable outcome (change in practice) was also related to an undesirable outcome (emotional distress) has several important implications for medical education.

An important part of residency training is the acquisition of confidence and clinical competence. Dealing with specific problems and situations allows a resident to build a general sense of competence to deal with medical problems. Early in training, many residents suffer from insecurity about their own adequacy, and making a serious mistake can add to this insecurity. It is important that residents deal as effectively as possible with mistakes when they occur so that their general sense of competence is strengthened rather than weakened.

What can medical educators do to help a resident deal effectively with a serious medical mistake? We suggest that educators provide specific advice about preventing the recurrence of the mistake, provide emotional support, and help residents interpret their distress.

Cases in our study suggest how a review of the incident can promote constructive changes by both the resident and the institution. This review can lead to discussions of areas of uncertainty in clinical decision making, for example, when residents are faced with the decision of whether to act on an abnormal finding. Reviewing the case can suggest areas where residents should increase their knowledge. Such reviews may also point out signs that residents should be more aware of, such as agitation as a sign of hypoxia. Reviewing the case may also help attending physicians to suggest constructive changes in practice. For example, residents who misinterpreted arterial blood gases or electrocardiograms should be encouraged to study more in these areas. A resident who makes a mistake caused by a lapse in routine, such as failing to place a nasogastric tube in a patient with a history of hematemesis, may benefit from advice to resist the temptation to forgo established routines, particularly at the end of a shift or when tired. After a mistake, it also may be useful to discuss the potential for counterproductive changes in practice, such as avoiding procedures after experiencing a complication. In this case, further supervised instruction could prevent the development of a phobia about a procedure. Case review may also identify situations in which attending physicians might provide additional back-up. These include cases where residents felt overwhelmed by competing demands on their time or by too many patients. When these situations arise, it is important that residents be encouraged to call for help. Finally, a review of cases may lead to suggestions to improve features of the system of care that contributed to the mistake. Such features might include an excessive number of admissions for residents, inadequate mechanisms in the pharmacy to flag overdoses of drugs, or an inaccessibility of consultants.

Emotional support can be provided in several settings including house officer support groups and discussions of mistakes at departmental retreats. Levinson and Dunn have described a model of small group discussions of mistakes that has been well received by participants.[23] Crisis counseling can be a model for providing one-on-one emotional support by the attending physician.[24] The initial discussion should focus on the mistake and the residents' reactions. The attending physician should allow the resident to express his or her emotions, validate these reactions, and provide reassurance. Therapeutic referrals should be offered when needed. Next, the attending physician should assess how the resident is coping with the mistake. The house officer should be encouraged to accept responsibility for and discuss the mistake and should be discouraged from forgetting about or avoiding thinking about it. In doing so, the resident who takes responsibility for a mistake cannot be expected to feel good about it at the same time.

The attending physician can help the resident interpret his or her feelings of distress as part of the process of learning from a mistake. The attending can also lessen distress by correcting mistaken attributions, such as that a mistake signifies incompetence as a physician. Providing emotional support to residents who accept responsibility for mistakes may make it easier for the residents to accept responsibility for mistakes in the future. For example, one resident who inadvertently ordered an overdose of levothyroxine commented, "This mistake sticks in my mind partly because the patient's attending was so kind and understanding when I called to tell him of my error." Attending physicians can help residents understand that other physicians who have accepted responsibility and experienced emotional distress have improved their subsequent practice and can convey the expectation that residents and future patients will benefit from these experiences.

Our findings also suggest that attending physicians

need to make a conscious effort to get mistakes out into the open. The importance of these efforts is underscored by the finding that barely half of residents told their attending physician about their mistakes.[11] Our previous results suggest that morbidity and mortality rounds are not settings in which information about mistakes is likely to surface.[9] Instead, attending physicians should take the lead in making discussions of mistakes a routine part of training. In one training program orientation, interns are given a talk by a popular and respected faculty member who candidly describes mistakes that she has made and the general lessons they have taught her. Attending physicians can also incorporate a discussion of the inevitability of mistakes and the importance of discussing them into introductory remarks with a new team while attending on wards. Formal and informal sharing by faculty of their own personal experience with mistakes may help make such discussions more acceptable.

Limitations

Our findings may be limited in several important ways. First, because accounts of mistakes and changes in practice were anonymous, we have no external confirmation of the data. Second, the limited response rate, the relatively small sample size, and the surveying of only internal medicine residents at three large teaching hospitals limit the generalizability of our findings. Nonresponse may have occurred in a nonrandom fashion, both among house officers who coped by the complete denial of a mistake and among others who remained too troubled by a mistake to confront the questionnaire. Finally, some associations we found may be due to relationships between study variables and unmeasured confounding variables, rather than cause-and-effect relationships between variables. For example, unmeasured personality characteristics of house officers might cause them both to cope by accepting responsibility and to make constructive changes in practice. Further research is needed to determine whether efforts to improve residents' coping skills also promote constructive changes in practice.

Internal consistency reliability was only moderate for five of the six coping scales and was low for one scale (accepting responsibility). In general, coping scales have lower internal consistency than trait measures because of the nature of coping: if a person uses one strategy successfully, he or she is not likely to turn to others. Because the reliability of a scale is the ceiling of its possible correlation with other variables, low internal consistency would lead to underestimates of the effects of coping and does not weaken the significance of the associations we found. To achieve a greater precision of responses, researchers measuring physician coping in future studies should consider using the original full-length scales in the Ways of Coping questionnaire.[21] Also, although the factor structure of the accepting responsibility scale has been shown to be stable across different populations, future studies might reexamine the constructs and their items.

Conclusion

Physicians responsible for educating house officers need to help them cope with their mistakes. They should begin to think of how to help residents cope in ways that promote constructive changes, such as by accepting responsibility. They should also be prepared to provide emotional support and to help residents maintain their confidence and develop professionally as they deal with their mistakes.

REFERENCES

1. McCue JD: The effects of stress on physicians and their medical practice. N Engl J Med 1982; 306:458-463

2. McCue JD: The distress of internship—Causes and prevention. N Engl J Med 1985; 312:449-452

3. McCall TB: The impact of long working hours on resident physicians. N Engl J Med 1988; 318:775-778

4. Butterfield PS: The stress of residency—A review of the literature [see comments]. Arch Intern Med 1988; 148:1428-1435

5. Folkman S, Lazarus RS: Coping as a mediator of emotion. J Pers Soc Psychol 1988; 54:466-475

6. Folkman S, Lazarus RS, Gruen RJ, DeLongis A: Appraisal, coping, health status, and psychological symptoms. J Pers Soc Psychol 1986; 50:571-579

7. Aldwin C, Revenson T: Does coping help? J Pers Soc Psychol 1987; 53:337-348

8. Folkman S, Lazarus RS: If it changes it must be a process—Study of emotion and coping during three stages of a college examination. J Pers Soc Psychol 1985; 48:150-170

9. Lazarus RS, Folkman S: Stress, Appraisal and Coping. New York, NY, Springer, 1984

10. Folkman S, Lazarus RS: An analysis of coping in a middle-aged community sample. J Health Soc Behav 1980; 21:219-239

11. Wu AW, Folkman S, McPhee SJ, Lo B: Do house officers learn from their mistakes? JAMA 1991; 265:2089-2094

12. Folkman S, Lazarus RS: The Ways of Coping. Palo Alto, Calif, Consulting Psychologist Press, 1988

13. Linn LS, Yager J, Cope D, Leake B: Health habits and coping behaviors among practicing physicians. West J Med 1986; 144:484-489

14. Eisendrath SJ, Link N, Matthay M: Intensive care unit: How stressful for physicians. Crit Care Med 1986; 14:95-98

15. Keller KL, Koenig WJ: Management of stress and prevention of burnout in emergency physicians. Ann Emerg Med 1989; 18:42-47

16. Alexander D, Monk JS, Jonas AP: Occupational stress, personal strain, and coping among residents and faculty members. J Med Educ 1985; 60:830-839

17. Quill TE, Williamson PR: Healthy approaches to physician stress. Arch Intern Med 1990; 150:1857-1861

18. Orman MC: Physician stress: Is it inevitable? Mo Med 1989; 86:21-25

19. Mermann AC: Coping strategies of selected physicians. Perspect Biol Med 1990; 33:268-279

20. Charles SC, Warnecke RB, Nelson A, Pyskoty CE: Appraisal of the event as a factor in coping with malpractice litigation. Behav Med 1988; 14:148-155

21. Matthews DA, Classen DC, Willms JL, Cotton JP: A program to help interns cope with stresses in an internal medicine residency. J Med Educ 1988; 63:539-547

22. May HJ, Revicki DA, Jones JG: Professional stress and the practicing family physician. South Med J 1983; 76:1273-1276

23. Levinson W, Dunn PM: A piece of my mind—Coping with fallibility. JAMA 1989; 261:2252

24. Schmidt CW, Roca R: Psychotherapy in ambulatory practice, *In* Barker LR, Burton JR, Zieve PD (Eds): Principles of Ambulatory Medicine, 3rd edition. Baltimore, Md, Williams & Wilkins, 1991, pp 111-116